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work. A mere reference is all that can be made here to the two forms of procedure which alone restrict the personal freedom or endanger the life of the freeman: the one, against thieves caught in the act; the other, against the criminal condemned to pay the *iwergeld*, or blood-fine, and unable to raise the money. The law itself never condemns to imprisonment or death; its action is limited to surrendering the criminal into his enemies' hands.

The book closes with a rapid sketch of the steps by which the more archaic, private procedure fell into disuse, and all actions, civil as well as criminal, were brought within the more elastic judicial process. To the original volume M. Thévenin has added, by way of appendix, monographs extracted from Sohm's larger book on the *Gerichtsverfassung*, illustrating certain important points of Salian law.

It need hardly be said that Sohm's books are not intended for amusement. They are undeniably hard reading, even for specialists. They aim at establishing the exact basis of history. It is the business of the future historian to popularize their results. But the future historian of early English society and law who undertakes to write without having first mastered the works of Sohm and his German critics will throw his labor away.

7. — *The New Chemistry*. By JOSIAH P. COOKE, JR. D. Appleton & Co. New York.

THE latest publication of the international scientific series is a small volume, with illustrations, containing thirteen lectures, by Professor Cooke, of Harvard University, which were delivered before the Lowell Institute in Boston, in the autumn of 1872.

The design of the author, as stated by himself, is "to bridge over the gulf which separates the old chemistry from the new. To explain the principles upon which the new philosophy is based, and to show in what it differs from the old." He has, undoubtedly, been led to his choice of a subject by the desire of bringing into an available form the wealth of new facts, which lies buried in the chemical journals of the last ten years, and which has not been presented to the English public in an adequate manner by any popular scientific book, nor indeed, in great part, by any book whatever.

The scope of this work may be gathered from the statement that it begins with Sir William Thomson's speculations regarding the size of molecules, and carries the reader through an account of the most important achievements of modern chemistry down to the production

of artificial Alizarine, the most important of the madder dyestuffs. It leads him from the simple law of Avogadro by a logical train of reasoning to the theories which enable chemists to dissect and map out the structure of the most complicated organic compounds; and it is high praise to say that the author has succeeded in adhering to the simplicity and unconventional treatment demanded by a course of popular lectures, while he has developed his subject with great clearness, with considerable detail, and, above all, with the most conscientious truthfulness.

The experiments are varied, well chosen, and well described by means of plates, and some of them will furnish new modes of illustration to other lecturers on the same subject.

The teacher will find this book an important aid in the arrangement and presentation of his subject. He will recognize the art of the experienced instructor in the useful reiteration of the more important facts, and in the clearness of the explanations; while the student may use this work as the best guide to the modes of thought in modern chemistry, which has yet appeared in an abbreviated form. The atomic theory, which is usually held at present by scientific men, is adopted, without a discussion of the divergent opinions of Deville and of Sir B. Brodie; and the author treads with peculiar predilection on the ground which lies between the chemical and the physical sciences. The most important laws derived from chemical experiments are defined; some of the principal chemical processes, such as combustion, are described; the theory of explosive compounds is dwelt upon at length, and the mode of expressing theories of chemical structure by means of formulæ is treated with precision and thoroughness.

The electro-chemical theories, too often neglected at present, are developed with much force and ingenuity of treatment. The book may be considered a worthy summary of the principal ideas of the new chemistry, and there are few important omissions to be noticed.

Under the latter head is to be regretted the absence of any special treatment of Deville's work upon dissociation, since his observations form the complement of some of the most important laws of chemical combination. No digest is given of the work of Julius Thomsen, Favre, and Berthelot upon heat as a measure of chemical activity, the table on page 186 and the other notices in that part of the book being insufficient to give an adequate idea of the discoveries in this field, — discoveries which, together with the facts in regard to dissociation, are particularly necessary to complete our conception of the phenomena of combustion, especially that of explosive compounds. Disregard of these recent publications seems to have led to the repetition on pages 178 and 181 of the old dictum, that analytical (destructive) reactions

are attended with absorption of heat ; synthetical reactions with evolution of heat. The fallacy of this law is illustrated by one of the cases which the author has cited as an example of an analytical reaction, namely, the spontaneous decomposition of Iodide of Nitrogen. This body is similar in constitution to Chloride of Nitrogen, for whose capacity for evolving heat see Berthelot.

The satisfaction implied in the remarks on page 13 regarding the beauty of the chemical nomenclature, which is used at present, is probably intended to apply chiefly to inorganic chemistry. A word surely would not have been out of place in criticism of a system which gives us such names as gammatetraalphanaphtolhemianhydridpyromelithenic acid. Nor is the nomenclature of inorganic chemistry without reproach ; want of agreement among chemists, some of the most modern of whom would not accept Professor Cooke's definition of an acid or a base, and the undue assumption of knowledge in regard to the structure of bodies, which occurs in the works of Dr. Frankland and of other chemists of the same school, have probably discouraged mineralogists and technical chemists from attempting to express their ideas through the medium of the latest theories.

Professor Cooke deals much with theories in these lectures, but they are used with care and judgment, and they are introduced to the popular reader with the sober caution to regard them only as guesses at truth, and to trust only the facts of the science, since they alone are immutable. A caution, it may be remarked, which is too often little heeded by popular writers of another class, who seek a foundation for their edifices upon the back of some scientific whale, mistaken for an island, until a submergence like that of Sindbad and his companions destroys their illusion.

The author maintains throughout the book the lecture form, with its vividness of expression ; and the exhaustive treatment of the subject, upon which he has ventured, betokens a confidence in the training of his audience in scientific matters, which is worthy of notice. The book is dedicated to John A. Lowell, LL. D., with an acknowledgment from the lecturer that he derived, when a boy, his taste for science from the early lectures of the Lowell Institute, which have been continued for more than thirty years. It is about ten years since a course of popular scientific lectures was instituted in Paris, in the great amphitheatre of the Sorbonne, and some two thousand people were unable to find entrance ; but even in that home of science the treatment is more superficial, and probably it is only with the lectures before the Royal Institution in London, which is in reality a scientific club, that these courses of the Lowell Institute can be compared.